



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,052	12/16/2004	Masayoshi Tatemoto	Q84889	3499
23373	7590	11/13/2009	EXAMINER	
SUGHRUE MION, PLLC			KOLLIAS, ALEXANDER C	
2100 PENNSYLVANIA AVENUE, N.W.			ART UNIT	PAPER NUMBER
SUITE 800			1796	
WASHINGTON, DC 20037				
NOTIFICATION DATE		DELIVERY MODE		
11/13/2009		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USPTO@SUGHRUE.COM

PPROCESSING@SUGHRUE.COM

Office Action Summary	Application No.	Applicant(s)
	10/518,052	TATEMOTO ET AL.
	Examiner	Art Unit 1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 21 August 2009.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-59 is/are pending in the application.
- 4a) Of the above claim(s) 1-7, 11-36 and 39-50 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 8-10, 37, 38 and 51-59 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/06)
 Paper No(s)/Mail Date 20080821
- 4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____
- 5) Notice of Informal Patent Application
- 6) Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 8/21/2009 has been entered.

Claim Objections

2. Claims 37 is objected to because of the following informalities: Claim 37 Line 8 recites "flouropolymer" which appears to be a typographical error of "fluoropolymer". Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 8, and 51-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bekiarian et al (US 2004/0167289), Doyle et al (US 6,140,436), Odian (*Principles of Polymerization*, see attached pages of previous Office Action) and Kaulbach et al (US 2004/0072977).

7. Regarding claims 8 and 51-56, Bekiarian discloses a fluoropolymer comprising a non-ionic monomer comprising pending side chains which comprising the group $-\text{SO}_3\text{NH}_4$ (Page 2 [0030]-[0032]) which are obtained via alcohol hydrolysis (Page 2, [0033]). It is noted that the fluoropolymer side-chains disclosed by the reference are identical to the side-chains presently recited in claim 56. Additionally, the reference discloses a method wherein the polymer is obtained by emulsion polymerization (Page 3, [0047] Page 4, [0048]) to obtain a liquid dispersion of the fluoropolymer. Furthermore, the reference discloses a process of emulsion polymerizing vinylidene fluoride (VDF) are copolymerized with a non-ionic monomer and a pendent group to produce a liquid dispersion (Page 2, [0030]-[0031], Page 3, [0046]-[0047], and

Page 4 [0048]). It is well known in the art that emulsion polymerization yields spherical particles as evidenced by Odian (see Page 341 of reference) and as such the claim limitations recited in claims 8 and 51 are met. As evidenced by Odian, emulsion polymerization produces particle sizes of 50 to 200 nm (see Page 341). The particle size range evidenced in Odian is within the particle size range recited in claims 52-54.

As further evidence that the process disclosed by Berkianian is emulsion polymerization, it is noted that the reference discloses the use of ammonium perfluorooctanoate in the polymerization process discussed above. Evidence supporting the Examiner's position is found on Page 3 [0024]-[0026] of Kaulbach et al which discloses fluorinated surfactants such as ammonium salts of perfluorooctanoic acid that are utilized as surfactants in aqueous emulsion polymerization processes. Given the evidence in Kaulbach and Odian, and given that Berkianian discloses a process of polymerizing PSEPVE and VF2 utilizing water and fluorosurfactant, it is clear that the process disclosed by Berkianian is not only drawn to emulsion polymerization but also results in spherical fluoropolymer particles.

Bekianian discloses all the claim limitations as set forth above. However, the reference does not explicitly disclose that the acid/salt group containing polymer is dispersed in a medium to form a liquid dispersion.

Doyle et al discloses a polymer comprising VDF and a perfluoroalkenyl monomer having pendent groups (Column 3, Lines 35-53). The reference discloses that both the pendent side-chains and olefin comprising the fluorinated sulfonyl group are hydrolyzed to SO_3M where M is a univalent metal by identical processes (Column 3, Lines 54-56). The reference discloses that the preparation of the copolymerization of VDF and the fluorinated side chains can either be

copolymerized together first and then hydrolyzed, or hydrolyzed first and then copolymerized (Column 4, Lines 1-8). The hydrolysis process disclosed by the reference is contacting the sulfonyl fluoride containing monomer or polymer with a mixture of alkali metal carbonate and methanol (Column 4, Lines 9-19 and Column 5, Lines 9-19). Additionally, the reference discloses that the sulfonyl fluoride copolymer resin can be hydrolyzed by suspension in a hydrolyzing medium (Column 4, Lines 64-66).

Given that both Bekiarian et al and Doyle are drawn to fluoropolymers comprising sulfonyl groups and hydrolysis of these copolymers via alkali hydrolysis, it would have been obvious to one of ordinary skill in the art to include the method steps disclosed by Doyle et al in formation of the fluoropolymer disclosed by Berkianian et al with a reasonable expectation of success.

Regarding the claim limitation recited in claim 55, that the fluoropolymer dispersion has more acid/salt groups on the particle surface than in the inside of the particle, it is the examiner's position that the properties in question are a direct function of, or are correlated to, the identity of the composition or the monomers that are used to make the composition, absent evidence to the contrary. It is for this reason that it is sound and proper to maintain that the properties in the present claims are intrinsically present in the applied reference.

8. Claims 9-10 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bekiarian et al (US 2004/0167289), Doyle et al (US 6,140,436) and Odian (*Principles of*

Polymerization, see attached pages) as applied to claims 8, and 51-56 above, and in view of Grot (US 4,433,082).

The discussion with respect to Bekiarian, Doyle and Odian as set forth in Paragraph 6 above is incorporated here by reference.

Regarding claims 9-10 and 38, the combined disclosures of Bekiarian, Doyle, and Odian teach all the claim limitations as set forth above. However, Bekiarian et al does not disclose that the liquid dispersion comprising 2 to 80 wt % fluoropolymer and that water comprises 10 to 100 wt % of the liquid medium.

Grot discloses that the fluoropolymer dispersion comprises 2 to 18 wt % of the dispersion (Column 7, Lines 8-11). It is noted that the amount of fluoropolymer disclosed by the reference is within the disclosed range of 2 to 80 % **recited claim 9**. The reference discloses an aqueous dispersion comprises a mixture of a liquid medium in the amount from 82 to 98 wt % (Column 7, Lines 8-11). The reference discloses that water comprises 30 wt % to 70 wt % water and 15 to 35 wt % propanol and 15 to 35 wt % methanol (Column 6, Lines 39-42). It is noted that the amount of water disclosed is within the claimed range of 10 wt to 100 wt % of the liquid medium as presented recited in the **claim 10**. The mixture of water with alcohols such as methanol and propanol meet the claim limitations recited in **claim 38**.

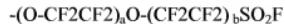
Given that both Bekiarian and Grot are drawn to fluoropolymer dispersions containing water and solvents, in light of the particular advantages provided by the use and control of the solvents such as alcohols as taught by Grot, it would therefore have been obvious to one of ordinary skill in the art to include such solvents in the fluoropolymer dispersion composition disclosed by Bekiarian with a reasonable expectation of success.

9. Claims 37, and 57- 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bekiarian et al (US 2004/0167289) in view of Doyle et al (US 6,140,436).

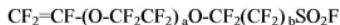
Regarding claims 37, and 57-59, Bekiarian et al discloses a process wherein VDF is copolymerized with a non-ionic monomer $\text{CF}_2=\text{CF}-(\text{O}-\text{CF}_2\text{CF}_2)_a\text{O}-\text{CF}_2(\text{CF}_2)_b\text{SO}_2\text{F}$ and pendent groups of the following form: $-(\text{O}-\text{CF}_2\text{CF}_2)_a\text{O}-(\text{CF}_2\text{CF}_2)_b\text{SO}_2\text{F}$ wherein $-\text{SO}_2\text{F}$ is hydrolyzed with ammonium carbonate to form a pendent group of the form: $\text{O}-\text{CF}_2\text{CF}_2)_a\text{O}-(\text{CF}_2\text{CF}_2)_b\text{SO}_3-\text{NH}_4$ (Page 2, [0030]-[0032], Page 3, [0046]-[0047] and Page 4, [0048]-[0049]). It is noted that the ionic monomer and side-chain disclosed by the reference are identical to Formulas (I) and (II) recited in claims 57-58. The reference discloses a process wherein the fluoropolymer, including precursor and fluoro-monomer are copolymerized to form an aqueous dispersion of fluoropolymer particles (Page 3 [0046]-[0047] and Page 4 [0047]-[0048]).

The reference teaches all the claim limitations as set forth above. However, the reference does not disclose that the fluoropolymer dispersion is produced without drying the fluoropolymer precursor and fluoropolymer

Doyle et al discloses a polymer comprising VDF and a perfluoroalkenyl monomer having pendent groups of the form (Column 3, Lines 35-53):



It is noted that the side chain disclosed by the reference is identical to the side chain recited in claim 57, wherein the sulfonic acid group is bound to the side chain of recited formula (I). Additionally, the reference discloses olefins of the following form (Column 3, Lines 54-67):



It is noted that the olefin disclosed by the reference is identical to the precursor given by Formula (II) recited presently in claim 58. The reference discloses that both the pendent side-chains and olefin comprising the fluorinated sulfonyl group are hydrolyzed to SO_3M where M is a univalent metal by identical processes (Column 3, Lines 54-56). The reference discloses that the preparation of the copolymerization of VDF and the fluorinated side chains can either be copolymerized together first and then hydrolyzed, or hydrolyzed first and then copolymerized (Column 4, Lines 1-8). The hydrolysis process disclosed by the reference is contacting the sulfonyl fluoride containing monomer or polymer with a mixture of alkali metal carbonate and methanol (Column 4, Lines 9-19 and Column 5, Lines 9-19). Additionally, the reference discloses that the sulfonyl fluoride copolymer resin can be hydrolyzed by suspension in a hydrolyzing medium (Column 4, Lines 64-66).

Given that both Bekiarian et al and Doyle are drawn to fluoropolymers comprising sulfonyl groups and hydrolysis of these copolymers via alkali hydrolysis, it would have been obvious to one of ordinary skill in the art to include the method steps disclosed by Doyle et al in formation of the fluoropolymer disclosed by Berkianian et al with a reasonable expectation of success.

Response to Arguments

10. Applicant's arguments filed 8/21/2009 have been fully considered but they are not persuasive.

11. Applicants argue that emulsion polymerization does not produce spherical fluoropolymer particles. As evidence of their position Applicants compare Example 5 of the present invention

to Example 1B of US Patent 7,482,415 in the Declaration under 37 C.F.R. 1.132 filed on 8/21/2009. However, it is significant to note that in the previous Office Action, US 7,482,415 was not utilized to reject the present claims. Instead, Berkianian in combination with Doyle and Odian was utilized against the present claims. While Example 1B of US '415 does not produce spherical fluoropolymer particles, the Declaration does not disclose fluoropolymer particles produced by the closest prior art of record. US '415 discloses polymerization steps which are not disclosed in the polymerization process disclosed by Berkianian et al. Significant differences in fluoropolymer polymerization processes disclosed by US '415 and Berkianian et al include the use of the fluorosurfactant ammonium perfluorooctanoate in the Berkianian reference. The compound, ammonium perfluorooctanoate, is a surfactant utilized in emulsion polymerization. Evidence supporting the Examiner's position is found on Page 3 [0024]-[0026] of Kaulbach et al (US 2004/0072977) which discloses fluorinated surfactants such as ammonium salts of perfluorooctanoic acid that are utilized as surfactants in aqueous emulsion polymerization processes. Further, as evidenced by Odian, emulsion polymerization results in spherical polymer particles. Thus, given the evidence in Kaulbach and Odian, and given that Berkianian discloses a process of polymerizing PSEPVE and VF2 utilizing water and fluorosurfactant, the Examiner's position remains that the process disclosed by Berkianian is not only drawn to emulsion polymerization but also results spherical fluoropolymer particles.

Further it is noted that Page 9, Lines 30-35, Page 13, Lines 2-6 and Page 27 Lines 19-32 of the present Specification disclose that fluoropolymer solid compositions comprising spherical fluoropolymer fine particles can be prepared from a dispersion obtain by emulsion polymerization. Given that the prior art of record also teaches emulsion polymerization, it is not

clear in light of Applicant's own admission why Applicants are arguing that Berkianian does not teach spherical particles.

12. Applicants argue that none of the references disclose that the fluoropolymer dispersion is produced without drying. However, it is noted that as set forth in the previous Office Action while Berkianian does not disclose that the fluoropolymer dispersion being produced without drying such a process is taught by Doyle. As set forth above, Doyle discloses that the preparation of the copolymerization of VDF and the fluorinated side chains can either be copolymerized together first and then hydrolyzed, or hydrolyzed first and then copolymerized (Column 4, Lines 1-8). The hydrolysis process disclosed by the reference is contacting the sulfonyl fluoride containing monomer or polymer with a mixture of alkali metal carbonate and methanol (Column 4, Lines 9-19 and Column 5, Lines 9-19). Additionally, the reference discloses that the sulfonyl fluoride copolymer resin can be hydrolyzed by suspension in a hydrolyzing medium (Column 4, Lines 64-66).

Further it is noted in response to Applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

13. Applicants arguments with respect to the 35 U.S.C. 102(b) rejection of the present claims over Grot have been considered but they are moot given that the reference is no longer applied against the present claims under 35 U.S.C. 102(b). It is noted however that Grot is utilized as a

teaching reference, while reference does not disclose all the features of the present claimed invention, the reference is used as teaching reference, and therefore, it is not necessary for this secondary reference to contain all the features of the presently claimed invention, *In re Nievelt*, 482 F.2d 965, 179 USPQ 224, 226 (CCPA 1973), *In re Keller* 624 F.2d 413, 208 USPQ 871, 881 (CCPA 1981). Rather this reference teaches a certain concept, namely amounts of water and alcohol in aqueous fluoropolymer dispersions, and in combination with the primary reference, discloses the presently claimed invention. If the secondary reference contained all the features of the present claimed invention, it would be identical to the present claimed invention, and there would be no need for secondary references.

14. Applicants cite the *Polymer* article by Gebel but do not state why the reference is being referred to. If Applicants are attempting to show that the presently claimed process w/o drying is critical, it is significant to note that Doyle discloses a process in which the fluoropolymer may be hydrolyzed by several methods including hydrolysis of the particles in a suspension, i.e. without drying. Further given that Gebel is drawn to a highly swollen membrane, it is not clear how this is applicable to the prior art of record.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXANDER C. KOLLIAS whose telephone number is (571)-270-3869. The examiner can normally be reached on Monday-Friday, 8:00 AM -5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571)-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. C. K./
Examiner, Art Unit 1796

/Vasu Jagannathan/
Supervisory Patent Examiner, Art Unit 1796